

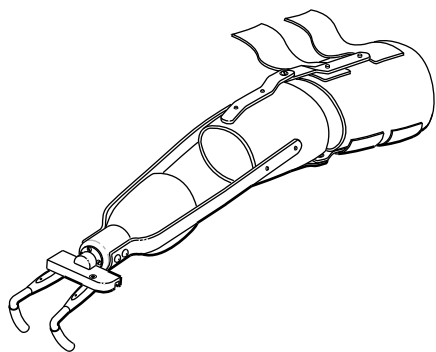
## NASA Technology Gives Montana Students a Helping Hand Into Industry and Amputees a Helping Hand in Life

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NASA technology may soon be providing tens of thousands of below-the-elbow amputees with a helping hand—literally.

Montana Hands, Inc., is a new company set up by engineering students at Montana State University in Bozeman to manufacture and distribute a new prosthetic device they've designed for below-the-elbow amputees. As they graduate, the students will step directly into the world of industry via their own company.

The basis for the students' forearm torque actuated terminal device's design lies in a similar device developed in 1986 at the Marshall Center. James Carden, a NASA engineer at Marshall, lost his lower left arm in a home woodworking shop accident. Carden was fitted with a commercially



**FIGURE 197.—The cheaper, smaller, lightweight design appears to offer a greater range of motion and mobility.**



**FIGURE 198.—Sandra Rossi, an early recipient of a NASA-designed prosthesis.**

available prosthesis after his injury had healed, but he found that it was clumsy and didn't allow him to handle heavy lumber or pursue his favorite pastime, fishing.

Hearing of Carden's injury, a team of coworkers and friends at MSFC banded together to offer their help. Carden accepted.

According to Carden's long-time friend and coworker Jewell G. "Pete" Belcher Jr., an MSFC engineer and a member of the team formed to help Carden, "Studies have shown that the work we proposed to do for Jim could benefit many thousands of other Americans as well as uncounted others around the world."

One of the team's designs was a grasping device which can be opened and closed by the amputee twisting his or her lower arm. This design has been adapted by the students at Montana State University into their own design, assisted in the process by George Studor, a NASA engineer assigned to the university to facilitate the transfer of NASA technologies.

Unlike conventional body-powered prostheses that use a cable and harness or battery-powered myoelectric devices, the new design attaches directly to the amputees arm. The

cheaper, smaller, lightweight design appears to offer greater range of motion and mobility, opposing hooks which open and close for grip and dexterity, an ability to grip various sized objects, and freedom from cables, harnesses and batteries. The new firm's device should be commercially available early in 1997.

In its charter, NASA is charged with facilitating the transfer of technology it and its contractors derive to the benefit of American businesses, schools and individuals. A NASA survey has shown that the improved below-the-elbow prosthesis could be used by 49,800 amputees in the United States alone. Headquarters endorsed the Center's work on the improved prostheses as authorized under this clause of the Agency's charter. NASA considers the work part of its overall technology transfer program as a biomedical applications project.

**Sponsor:** Office of Commercial Development and Technology Transfer

**Biographical Sketch:** Bob Lessels is the technical writer/editor (physical sciences) for the Technology Transfer Office at MSFC. A graduate of the University of Nebraska, he has been a professional journalist for the past 30 years. He joined NASA in 1986. ■